3GPP TSG RAN WG4 Meeting #112 R4-2414024

Maastricht, NL, 19 Aug. 2024 – 23 Aug. 2024

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** | **4810** | **rev** |  | **Current version:** | **18.6.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

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| ***Title:***  | CR to TS 38.133 on RRM SCG activation deactivation test case for FR1-FR1 inter-band NR-DC with target Pscell in FR1 |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_RRM\_enh3-perf |  | ***Date:*** | 2024-08-22 |
|  |  |  |  |  |
| ***Category:*** | D |  | ***Release:*** |  Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | Rel-18 NR-DC FR1-FR1 enhancement to add test case for FR1-FR1 NR-DC |
|  |  |
| ***Summary of change:*** | Update the SCG activaiton/deactivation for both RACH and RACH-less activation known case with editorial modification to remove the bracets. |
|  |  |
| ***Consequences if not approved:*** | Corresponding test case is not complete |
|  |  |
| ***Clauses affected:*** | A.7.5.17 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

Start of Change 1

### A.7.5.17 SCG Activation and deactivation for FR1+FR1 inter-band with target PSCell in FR1

#### A.7.5.17.1 Test Purpose and Environment

The purpose of this test case is to test the activation PSCell delay for a UE configured with one deactivated SCG in NR-DC and when PSCell in one SCG is being activated. The test also tests the deactivation delay. The test case tests the requirements within which the UE shall be able to activate the deactivated SCG in section 8.17.2 for when PSCell is known and TCI state is known. The PCell is in NR FR1 and the PSCell is in NR FR1.

The supported test configurations are defined in Table A.7.5.17.1-1. The test parameters for NR cell are given in Tables A.7.5.17.1-2. And cell specific test parameters are described in Tables A.7.5.17.1-3.

During T1 the PSCell is configured in deactivated state. The TE ensures that the deactivated PSCell remain known until the PSCell is activated.

At T2 an RRC message for activation of PSCell is sent by the test equipment.The point in time at which the RRC message, for activating of the PScell , is received at the UE in slot n defines as the starting point of T2

During T2, the test equipment monitors for PRACH preamble from the UE on the PSCell. The time when TE receives a preamble from the UE is denoted as starting point of T3.

During T3 the TE monitoris the msg3,and after sending the msg4, the TE sends the RRC deactivation command to the UE. The point in time at which the RRC message for deactivating the PSCell is received at the UE in slot n defines the starting time of T4.

During the time period T4, the UE is configured with measCyclePscell , *bfd-and-RLM* with value true . And the TE sends the 2nd RRC activation command.

The time when UE receives the 2nd RRC activation command in slot n , defines as the starting time of T5.

During T5, the test equipment monitors for SR from the UE on the PSCell. The time when test equipment receives a scheduling request from the UE is denoted as the ending point of the test.

The test equipment verifies that potential interruption is carried out in the correct time span by monitoring ACK/NACK sent in PCell during activation and deactivation of the PSCell, respectively.

For 1st time activation during T2, the test equipment verifies the activation time by when the Random Access preamble from the UE is received in the activated PSCell.

During T4 and T5 the TE ensures that that TCI state is known.

For the 2nd time activation during T5, the test equipment verifies the activation time by when the SR from the UE is received in the activated PSCell. The TE verifies the deactivation time by counting the slots from the time when the PSCell deactivation command is sent until UL transmission from the PSCell is discontinued.

Table A.7.5.17.1-1: Supported test configurations for FR1 PSCell activation case

|  |  |
| --- | --- |
| **Configuration** | **Description** |
| 1 | PCell: 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex modeTarget PSCell: 120 kHz SSB SCS, 100MHz bandwidth, TDD duplex mode |
| 2 | PCell: 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex modeTarget PSCell: 120 kHz SSB SCS, 100MHz bandwidth, TDD duplex mode |
| 3 | PCell: 30kHz SSB SCS, 40MHz bandwidth, TDD duplex modeTarget PSCell: 120 kHz SSB SCS, 100MHz bandwidth, TDD duplex mode |
| Note: The UE is only required to pass in one of the supported test configurations |

Table A.7.5.17.1-2: General Test Parameters for FR1FR1 PSCell activation and deactivation

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | Unit | Value | Comment |
| RF Channel Number |  | 1, 2 | Two NR radio channels are used for this test, cell 1 and cell2 use RF channel 1 and 2, respectively. |
| Initial  | Active PCell |  | Cell1 | PCell on RF channel number 1. |
| Condition | Deactivated PScell |  | Cell2 | To be activated PSCell on RF channel number 2. |
| Final  | Active PCell |  | Cell1 | PCell on RF channel number 1. |
| Condition | Activated PScell |  | Cell2 | PSCell activated on RF channel number 2. |
| DRX |  | OFF | Continuous monitoring of primary cell |
| Scheduling request resource priodicity |  | 20ms | At the starting of period T6, UE sends a SR on PUCCH for PSCell |
| T1 | s | 1 | During this time the PScell is deactivated |
| T2 | s | 1 | During this time the TE activated the PScell |
| T3 | s | 0.5 | During this time the PScell is activated |
| T4 | s | 0.5 | During this time the TE deactivate the PScell |
| T5 | s | 1 | During this time, PScell and TCI state shall be known the TE activate the Pscell |

Table A.7.5.17.1-3: Cell specific test parameters for FR1-FR1 PSCell activation case

|  |  |  |  |
| --- | --- | --- | --- |
| ParameterNote 5 | Unit | Cell 1 | Cell 2 |
| T1 | T2 | T3 | T4 | T5 | T6 | T1 | T2 | T3 | T4 | T5 | T6 |
| SSB ARFCN |  | Freq1 | Freq2 |
| Duplex mode | Config 1 |  | FDD | TDD |
| Config 2,3 |  | TDD |
| TDD configuration | Config 1 |  | Not Applicable | TDDConf.3.1 |
| Config 2 | TDDConf.1.1 |
| Config 3 | TDDConf.2.1 |
| Downlink initial BWP Configuration | Config 1,2,3 |  | DLBWP.0.1 |
| Downlink dedicated BWP Configuration | Config 1,2,3 |  | DLBWP.1.1 |
| Uplink initial BWP configuration | Config 1,2,3 |  | ULBWP.0.1 |
| Uplink dedicated BWP configuration | Config 1,2,3 |  | ULBWP.1.1 |
| TRS configuration | Config 1,2,3 |  | N/A | TRS.2.1 TDD |
| TCI state | Config 1,2,3 |  | TCI.State.0 |
| BWchannel | Config 1,2 | MHz | 10: NRB,c = 52 | 100: NRB,c = 66 |
| Config 3 | 40: NRB,c = 106 |
| PDSCH Reference measurement channel | Config 1 |  | SR.1.1 FDD | - |
| Config 2 |  | SR.1.1 TDD |
| Config 3 |  | SR.2.1 TDD |
| RMSI CORESET Parameters | Config 1 |  | CR.1.1 FDD | - |
| Config 2 |  | CR.1.1 TDD |
| Config 3 |  | CR.2.1 TDD |
| Dedicated CORESET Parameters | Config 1 |  | CCR.1.1 FDD | - |
| Config 2 | CCR.1.1 TDD |
| Config 3 | CCR.2.1 TDD |
| OCNG Patterns |  | OP.1 |
| SSB configuration | Config 1,2 |  | SSB.1 FR1 | SSB.3 FR1 |
| Config 3 | SSB.2 FR1 |
| CSI-RS configuration for CSI reporting | Config 1~3 |  | N/A | CSI-RS.3.1 TDD |
| reportConfigType for CSI reporting |  |  | periodic | N/A |
| reportConfigType for L1-RSRP |  |  | periodic | N/A |
| reportQuantity for CSI reporting |  |  | cri-RI-PMI-CQI | N/A |
| reportQuantity for L1-RSRP |  |  | ssb-Index-RSRP | N/A |
| CSI reporting periodicity | Config 1,2 | slot | 5 | N/A |
| Config 3 | 10 |
| L1-RSRP reporting periodicity Note 7 | Config 1,2 | slot | 5 | N/A |
| Config 3 | 10 |
| CSI reporting offset | Config 1,2 | slot | 2 | N/A |
| Config 3 | 4 |
| L1-RSRP reporting offset | Config 1,2 | slot | 2 | N/A |
| Config 3 | 4 |
| SMTC configuration |  | SMTC.1 |
| TimeAlignmentTimer |  | Infinity |
| EPRE ratio of PSS to SSS | dB | 0 |
| EPRE ratio of PBCH\_DMRS to SSS |  |  |
| EPRE ratio of PBCH to PBCH\_DMRS |  |  |
| EPRE ratio of PDCCH\_DMRS to SSS |  |  |
| EPRE ratio of PDCCH to PDCCH\_DMRS |  |  |
| EPRE ratio of PDSCH\_DMRS to SSS |  |  |
| EPRE ratio of PDSCH to PDSCH\_DMRS |  |  |
| EPRE ratio of OCNG DMRS to SSSNote 1 |  |  |
| EPRE ratio of OCNG to OCNG DMRS Note 1 |  |  |
| Propagation conditions |  | AWGN | AWGN |
| Scheduling request resource priodicity | ms | N/A | 20 |
| Note2 | dBm/15kHz | -98 | -98 |
| Note2 | Config 1,2 | dBm/SCS | -98 | -98 |
|  | Config 3 |  | -95 | -95 |
|  | dB | 4 | 4 | -Infinity | 5 |
|  | dB | 4 | 4 | -Infinity | 5 |
| SSB\_RP | Config 1,2 | dBm/SCS | -94 | -94 | -Infinity | -90 |
|  | Config 3 | dBm/SCS | -91 | -91 | -Infinity | -63.85 |
| IoNote3 | Config 1,2 | dBm/9.36MHz | -64.59 | -64.59 | -70.05 | -57.75 |
|  | Config 3 | dBm/38.16MHz | -58.49 | -58.49 | -63.94 | -57.75 |
| Propagation condition | - | AWGN | AWGN |

##### A.7.5.17.2 Test Requirements

RRC message for activation of the PSCell is received in slot *n* at the UE and denotes the starting point of T2. During T2 the UE shall send the first preamble on PSCell in the first available PRACH occation no later than:

Tactivation\_time = TRRC\_delay + Tprocessing + Tsearch + T∆ + TIU + 2 ms

After T2 as defined on section 8.17.2.

In this test case:

Tprocessing = 5 ms

Tsearch = 0ms PSCell and TCI state are known, and

T∆ = 20ms.

Tiu = 10ms.

This allows T2 of Tactivation\_time = TRRC\_delay + 37ms

The UE shall stop all transmissions on the PSCell no later than in slot n + $\frac{T\_{RRC\\_delay}}{NR slot length}$ after T4, as defined in 8.17.3.

The 2nd RRC activation command is received in slot *n* at the UE as the starting time of T5. During T5 the UE shall send the first SR on PScell in the first available uplink SR resource no later than T5 which is :

Tactivation\_time = TRRC\_delay + Tprocessing + Tsearch + T∆ + TIU + 2 ms

as defined on section 8.17.2. In this test case:

Tprocessing = 5ms (no RRC parameter has been modified)

Tsearch = 0ms (RACH-less activation PScell and TCI state are known), and

T∆ = 20ms.

Tiu = 10ms.

This allows T5 PSCell activation time of Tactivation\_time = TRRC\_delay + 37 ms

During T2 and T5 the interruption of PCell during PSCell activation shall not happen outside the slot *m + TRRC\_delay*.

During T4 the interruption of PCell during PSCell deactivation shall not happen outside the slot *n + TRRC\_delay*.

The interruption duration on PCell due to activation and deactivation of PSCell shall not be more than the values specified for in Clause 8.17.2 and 8.17.3.

End of Change 1